Survival analysis of birth intervals: evidence for unbiased maternal investment. D.J. WALKER, The Pennsylvania State University, University Park, PA 16802.

Evolutionary theory predicts that the interval following the birth of a son should be longer than the interval following the birth of a daughter. Sex differences in development suggest that sons are energetically more costly to mothers than daughters. The birth of a son, therefore, is expected to result in a larger reduction in future maternal reproductive potential (a longer birth interval) than the birth of a daughter.

The sample consists of fertility histories for 5800 Mexican American women, born between 1808 and 1929, who completed their fertility prior to 1950. The sample is a subset of the genealogical data base of Laredo, Texas compiled by K.M. Weiss and A.V. Buchanan of the Pennsylvania State University.

Survival time analysis was used to test whether the time to the failure event (a subsequent birth) differed by the sex of the previous offspring. The intervals following the first through tenth births were analyzed separately.

Survival time distributions for each of the ten interbirth intervals do not show significant differences by sex of the previous offspring, with one exception. The interval following a second birth is significantly longer after a daughter than a son (Wilcoxon p=.0078; log-rank p=.0232).

The use of birth interval length as a measure of maternal investment may be confounded by other factors, such as maternal age and parity, or birth interval length may not be an appropriate measure of maternal investment in this population. Mexican American mothers may be differentially investing in sons and daughters through other investment mechanisms.

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A New Method for Estimating Age at Death and Dental Wear Rates from Crown Height Measurements. P.L. WALKER and P. SHAPIRO, University of California, Santa Barbara, California 93106

We have developed a new procedure for estimating age from molar crown heights that avoids many of the problems of previous techniques. In this method, equations for age prediction are derived using data on the timing of tooth eruption, the heights of unworn teeth, and the statistical relationship between the heights of worn teeth from the same jaw. Age estimates based these equations closely match ages determined using non-dental aging criteria. Logarithmic transformations of the variables used in the equations were found to significantly increase the predictive capacity of our models.

The coefficients used for age estimation can provide valuable information on population differences in wear rates.

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An assessment of histological age determination techniques. R.A. WALKER, U.S. Army Natick RD&E Center, Natick, Massachusetts 01760-5020.

Quantitative and qualitative changes with age in the cortex of the anterior femoral midshaft were examined in a sample of 173 specimens. Sex and age of all individuals in the study sample are documented. However, the study was carried out as a blind test, and the investigator did not have access to this information at the time that age estimates were made. Ages of the specimens were estimated by means of published regression equations which use several quantitative histological features (e.g. Kerley, Singh and Gunberg, and Ahlqvist and Damsten). A new regression equation derived from osteon counts was also developed for this purpose. Additionally, age was assessed for each specimen by seriation on the basis of cortical bone microstructure. Qualitative seriation of specimens was found to estimate age with greater accuracy and less bias than the regression techniques. Further, seriated qualitative age estimates produced a distribution which was not significantly different from that of the known age distribution of the sample. None of the regression techniques were capable of accurately reconstructing the age composition of the test population.

Histological age determination was also tested as a part of the summary age technique in specimens derived from the Hamann-Todd human skeletal collection. When histological age estimates were included as a part of the summary age technique (in combination with age estimates from the pubic symphysis, auricular surface of the ilium, cranial suture closure, dental attrition, and radiographs of the femur), the correlation with known age increased from .796 to .803 and the standard error of the estimate decreased from 5.917 years to 5.433 years. The improvement in correlation and reduction of standard error were greater among males than among females.